Session 1: Statistical coverage of new trends in tourism

The importance of online tourism demand

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Abstract

In recent decades, the combination of tourism and Information and Communication Technologies (ICT), has originated considerable changes in tourists' behaviour. The analysis of tourism demand resulting from the Internet is of growing importance, given the increasing number of online reservations observed in recent years.

However, in order to analyse the new trends caused by online bookings, the availability of data enabling the measurement and characterization of this phenomenon is essential. This has, however, been a considerable limitation, given that either no data on key variables is available or the available data is sometimes of questionable quality.

For professionals and researchers in the area of tourism, the high volume of tourists who use the Internet to make hotel and travel reservations is worth of consideration, given that it may potentiate the discovery of new source markets, the identification of clients with different characteristics and may help explain the dynamics between suppliers or countries.

The existence of predictive studies to support decision-making and planning, by professionals of the tourism sector, is of great importance. Panel data models are a useful and appropriate method for the analysis and modelling of tourism demand. These models consider both the time series and the cross-sectional dimensions of the data and allow for the inclusion of social variables.

The results of estimation of tourism demand, through panel data models, show that the Internet and the sharp technological development have encouraged the increasing demand for tourism. The growing number of tourism companies online will naturally promote or potentiate an increase of tourism demand.

Keywords: e-tourism, Information and Communication Technologies, Panel Data, Tourism Demand, Tourism Information Systems.

1. Introduction

Tourism activity has experienced several changes over the past few decades due to the strong development of information and communication technologies (ICT), which has characterized the world situation. Associated with the development of ICT the Internet has emerged as an excellent platform for communication and information sharing between various points of the globe. The Internet combined with tourism came to revolutionize the way of travelling. One of the changes caused by this alliance, was that it allowed for the emergence of an interactive environment where customers may create their travel according to their wishes.

The ICT and the development of tourism are intertwined (interlinked), since it is difficult to identify where ICT generate or facilitate changes in demand and in the touristic supply. The tourism activity increases the requirements, by expansion of tourists' needs and by the demand of users. The ICT have the tools to suit the needs of tourism and to enable the development and increase of competitiveness of tourism supply and demand.

This article is structured into three key points. The first point presents the potential of the alliance between tourism and ICT, particularly in terms of tourist demand. The second point aims to provide the characterization of tourism demand and the tools needed for the modeling exercise. The third point, in addition to the methodology, presents and comments on the results obtained in the modeling and estimation of tourism demand with panel data. Finally, we conclude the paper with a discussion of some of the considerations obtained from this study.

2. Tourism and the ICT

The tourism sector is characterised by the intensive production of information, to meet the needs of the various actors (Ramos *et al.*, 2009). To satisfy tourists, it is necessary to produce information about, for instance, tourist destinations,

availability, prices, climate, and geography. To satisfy the supply side, it is necessary to produce information about, for instance, companies, preferences of the tourists, intermediaries, competitors and trends in tourist market. To satisfy the needs of intermediaries, it is necessary to produce information about, *inter alia*, trends in tourist market, tourist destinations, alternative destinations, facilities, availabilities, prices, tour packages. To satisfy the needs of Destination Marketing Organizations, it is necessary to produce information about trends in the sector, the size and nature of tourism flows, development policies and plans and others considered relevant. In this context and in the tourist activity, information is the primordial element between the various actors in the value chain of this sector, which generates information flows between the various actors and generates an excessive dependence of information.

On the other hand, the existence of ICT characterized by capabilities to store, manage and present information that allows for the analysis of the tourism activity will provide competitive advantages for all economic actors in this sector, from tourists to organizations related to tourism. Within ICT, it is important to emphasize the need for the Internet as a means of information exchange between different points of the globe, electronic commerce, which allows you to purchase online components to a tourist destination, and information systems, to manage, storage and process all the information associated with the tourist's activity, required for all participating decision makers in this sector, from the tourist to the entrepreneur.

The combination or alliance between these two partners - tourism and ICT, and in terms of optimization the use of technology in tourism activity, will allow to improve the response times to external requests, as for example, a faster and efficient form to answer to tourists inquiries and needs, and to increase the development of tourism in a society increasingly more competitive and technological evolved, for example by presenting more competitive prices. In addition, it also enables organizations to improve the flow of information between actors, facilitating and loosening the exchange of information between stakeholders. In this context, the phrase "Tourism organizations that need to

compete will need to compute" by Buhalis (2003) summarizes in a simple way the union between ICT and tourism. The union between ICT and tourism has generated conceptual research referenced by other authors: Buhalis, 1994 Buhalis *et al.*, 2006, O'Connor, 1999, Poon, 1993, Sheldon, 1997 and Werthner, 1999, among others.

In light of the above, it should be noted that an increasingly technological environment has resulted in the changing of the tourism consumer behaviour, which has contributed to the massive growth of tourism, helped increase the volume of supply and demand in tourism, has allowed for the increase in tourist product differentiation, has encouraged radical changes in the distribution of tourism; hence making in this way ICT the most powerful partner of the tourism industry.

The tourist distribution started to resort to electronic means, more commonly known as electronic distribution in tourism, creating in this way direct means of communication between customers and producers (Roman, 2005), without having to pay commissions and distribution costs. In this context, there is a new technological type of tourist, making use of the Internet to find information about products and services at the destination, searching for lower prices and discounts, making booking and purchase of tourism products isolated or in the form of packages, keeping up to date on the environmental characteristics of the destination and elaborating his/her own travel itinerary (Ramos *et al.,* 2009). In addition, the Internet brings tourists a new way to book travel components according to their preferences.

Analyzing tourism demand made via the Internet is becoming increasingly important, since the number of reservations online not only has grown in recent years as it will maintain the growth trend in the future. It should be noted that there is a considerable lack of studies of the volume of tourists that make their reservations on-line. The importance of this issue is that it will contribute to shed some light on this subject as well as on the possibility of discovering new markets, new customer preferences and new dynamics between suppliers and

others involved in tourist distribution. Furthermore, it models and investigates the variables that affect tourism demand, with the purpose to produce forecasts.

3. Tourism Demand

In economic terms, the importance of the tourism sector is not characterised by the production of goods and services, but by the demand side. In other words, tourism demand can be defined by a "set of goods and services that people acquire to accomplish their journeys, expressed in terms of quantity" (Cunha, 2003). Tourism demand analysis implies the detection of factors that determine it, in national (see table 1) and international terms (see table 2).

Table 1 – Factors that affect national tourism demand

Factors:	Main Components:
Socio-economics	• Income; • Prices; • Demographics; • Urbanization; etc.
Technical	• Technological progress; • New ITC.
Randoms	• Factors variables, unpredictable or occasional.
Psycho-sociological	• Social, cultural aspects, etc.

Source: Authors' elaboration based on Cunha (2003).

Table 2 - Factors that affect international tourism demand

Factors:	Main Components:
Economics	• Income; • *Gross domestic product per capita*; • Private consumption; • Consumer price index; • Tourism prices; • Transportation costs; • Cost of living in the country of destination; • Marketing; • Distance; ...
Psycho-sociological	• Demographic factors; • Past experience; …
Exogenous	• Technological progress; • Degree of urbanisation; • Special Factors: mega-events, etc.

Source: (Uysal, 1998)

Due to the difficulty of relating the factors presented, researchers have focused on the discovery of the determinants that impact more on tourism demand.

3.1 Determinants and Measures of Tourism Demand

It is possible to enumerate various reasons for a tourist to visit a given destination, but most of the times, what motivates the visit is only the enjoyment of the holidays, which determines the need to find a suitable destination.

In this context, it is important to detect local characteristics that influence the preference as a tourism destination, which is defined, through, variables (its determinants), which are possible to quantify, and which prove appropriate for the analysis of tourism demand.

3.1.1 Measures of Tourism Demand

The definition and measure of tourism demand can be expressed in different ways. It can be considered through the number of tourists who visit a country or region, the number of passengers who use a particular type of transport, the number of overnight stays in a particular type of accommodation, the number of people who use certain recreational infrastructure or participate in a given activity, among others.

3.1.2 Determinants of Tourism Demand

The nature of the tourism activity allows the identification of a set of variables that will enable the explanation of tourism demand in a given country (see Table 3).

Table 3 – Summary of the most frequently referenced determinants of Tourism Demand

Source: Determinant:	Daniel and Rodrigues (2005)	Crouch (1994 b)	Li, Song and Witt (2009)	Uysal (1998)	Witt and Witt (1995)	Song, Witt and Li (2009)	Correia (2000)
Population					X		X
Income	X	X	X	X	X	X	X
Prices: 1. Cost of travel to the destination 2. Cost of living in the country of destination	X X	X X	X X	X X	X X	X X	X X
Substitutes Prices	X	X	X		X	X	X
Exchange rates		X	X	X	X	X	X
Marketing	X	X		X	X	X	X
Trend	X	X	X		X		X
Dummy Variables	X	X	X	X	X	X	X
Lagged Variable	X	X			X		X
Others	X			X		X	X

Source: Authors' elaboration

Currently, the analysis of tourism demand without considering the technological environment that characterizes the society, to which the tourism sector is extremely sensitive, appears to be reductive and does not potentiate the work of the professionals of the sector, both in terms of research and decision-making. In this context, it is relevant to identify other variables which can be used to help better understand the phenomenon of tourism demand, as for example: identification of the volume of overnight stays that were booked online or the identification of online reservations that were made in a particular year (electronic commerce).

Tourism demand behavior can be expressed though an equation or function of the variables identified in Tables 1 and 2. This representation will help researchers and professionals to define and estimate a mathematical model that enables the analysis of demand for a tourism destination.

3.2 Tourism Demand Function

The tourism demand function of a destination (see equation 1 below), defines the relationship between the variables that motivate this demand. The tourism demand function for destination *i* by the residents in origin *j* is given as (Song and Witt, 2000):

$$Q_{ij} = f(P_i, P_s, Y_j, T_j, A_{ij}, \varepsilon_{ij}) \quad (1)$$

where:

Q_{ij} is the quantity of the tourism product demanded in destination *i* by tourists from country *j*;

P_i is the price of tourism for destination *i;*

P_s is the price of tourism for substitute destinations;

Y_j is the level of income in origin country *j*;

T_j is the consumer taste in origin country *j*;

A_{ij} is advertising expenditure on tourism by destination *i* in origin country *j*;

ε_{ij} is the term that includes other factors that can influence the amount of demand for tourism products in destination *i* by tourist from country *j*.

The tourism demand function presented in (1) is a theoretical model that only indicates the potential relationship between variables. In practice, the two most common equations for tourism demand assume either a linear relationship (see equation 2) or an exponential relationship (see equation 3) between the dependent and independent variables.

The linear tourism demand function (Song and Witt, 2000) is given by:

$$Q_{ij} = \alpha_0 + \alpha_1 P_i + \alpha_2 P_s + \alpha_3 Y_j + \alpha_4 T_j + \alpha_5 A_{ij} + \varepsilon_{ij} \quad (2)$$

where Q_{ij} , P_i , P_s , Y_j , T_j and A_{ij} are the variables previously defined, α_0, …, α_5 are coefficients that need to be estimated and ε_{ij} is the random error term.

The exponential tourism demand function (Song and Witt, 2000) is given by:

$$Q_{ij} = A P_i^{\alpha_1} P_s^{\alpha_3} Y_j^{\alpha_3 - 1} T_j^{\alpha_4} A_{ij}^{\alpha_5} u_{ij} \quad (3)$$

where Q_{ij} , P_i , P_s , Y_j , T_j and A_{ij} are the previously defined variables, A, α_0 , …, α_5 are coefficients that need to be estimated and u_{ij} is the disturbance term.

This exponential relationship (also known as Cobb-Douglas function) is the most widely used in the literature, because their coefficients can be interpreted as elasticity's, which makes it more intuitive to examine the sensitivity of tourism

demand to changes in the independent variables and also allows comparisons to be made with other studies (Song and Witt, 2000).

4. Panel Data Models

Panel data models consider the cross sectional and time series properties of the data, for example, tourism revenue observed by origin and over time. With the use of panel data, it is possible to simultaneously analyse changes of the variables over time and between different units. The use of panel data presents several advantages (Baltagi, 1995 and 2001): it allows to control for individual heterogeneity of each section; to present more information, more variability, less colinearity between the variables, more degrees of freedom and greater efficiency; to study the dynamic adjustment arising unexpectedly; to identify and measure effects that simply are not detected in data that are purely temporal or cross-sectional; and are frequently used in small samples, where there is less data but more variables.

However, panel data also has some limitations (Baltagi, 1995 and 2001), for instance, (i) in the organization of the data, in terms of collecting and compiling the data; (ii) distortions of the errors of evaluation of the results may occur and the time series are considered only for a few years. There are also additional complications due to heterogeneity of data, due to different economic structures between countries, regions, enterprises, behaviours and different tastes of consumers that complicate the process of model estimation. In accordance with Song, Witt and Li (2009), panel data models have advantages over econometric models based on time series, since the former integrate more complete information by using time series and cross-sectional data. However, to date, this method has had very little application in the analysis of tourism demand, with the exception of the studies referenced in Ledesma-Rodriguez, *et al.* (2001), that used panel data to model Tenerife's tourism demand, Naudé and Saayman (2005) and Roget and Gonzalez (2006) that use panel data models to examine tourism demand in 43 African countries and the demand for rural

tourism in Galicia, respectively, and Sakai *et al.* (2000) who resorted to panel data models to analyze the effects that demographic changes cause on the propensity to travel of the Japanese population. However, prior to these studies others had already referred to the importance of panel data analysis in tourism demand; see Carey (1991), Song and Witt (2000), Song, Witt and Li (2009), Tremblay (1989), Witt (1980a, 1980b) and Yavas and Bilgin (1996).

4.1 Estimation Methodology and Tourism Demand Modelling using Panel Data

The proposed methodology for modelling and estimating tourism demand using panel data is based on: (i) the formulation of hypotheses based on the theory of demand; (ii) the specification of the tourism demand model; (iii) collecting the data which is considered relevant for tourism demand; (iv) modelling and estimation of tourism demand; (v) testing the hypotheses considered; (vi) forecasting; and (vii) accuracy measurement of the forecast results.

4.2 Formulating Hypotheses

Currently, analysing tourism demand without regards to the technological environment, to which the tourism sector is extremely sensitive to, appears to be restrictive.

In today's information society, it is increasingly relevant to identify variables relating to ICT, such as, for example, the year in which promotional sites appeared and offers of a particular destination, the number of overnight stays that were booked online, the first year in which it was possible to make online reservations (beginning of the electronic commerce), entities connected to the Internet, and the number of Internet users, which are considered relevant in the characterization of today's society.

The present study intends to answer the question: Whether ICT, in particular the Internet, contribute to the increase of tourism demand of a certain country?

4.3 Model Specification

In 2007, according to the Euromonitor, Western Europe received 43,38% of the 2.158.743.800 international tourists worldwide. In Western Europe, the United Kingdom (27,06%), followed by Spain (15,16%) and Italy (11,20%) are the three countries that more motivate tourists to accomplish their journeys.

4.3.1. Determinants and Measures

A) Countries: in this study 25 Western European countries were considered.

B) Sample Period: the data used were obtained from the website of Euromonitor international, which annually publishes the World Economic Factbook, and provided free access from May to June 2008. The data were analysed from 1985 to 2007.

C) Dependent Variable: The number of overnight stays was considered, since it is the most widely used variable in studies on tourism demand.

D) Independent Variables: a) Productivity, as a measure for analysing the characteristics of the population; b) Total of Gross Domestic Product, as a measure for analysing income; c) Passengers on scheduled flights, as representative of the price determinant – the component cost of travel to the destination; d) Consumer price index (base 1995), as representative of prices – the component cost of living at the destination; e) Purchasing power parity, as representative of exchange rates; f) Total spending on advertising, as representative of Marketing; g) Electronic commerce, as a Dummy variable, which assumes a value of zero if a year before 2002 is considered and one if the year under consideration is 2002 or after. In addition to these explanatory variables, it matters to consider one that represents the environment provided by ICT. The number of Internet users was the

variable chosen to represent the role played by ICT in tourism demand.

4.3.2. Tourism Demand Function and its Functional Form

A) The functional form of tourism demand for country *i*, considers the variables mentioned above, i.e.,

$$D_i = f(P_i, Y_i, C_i, V_i, E_i, A_i, I_i, M_i, \mu_i) \quad (4)$$

where:

Di is the number of nights international tourists spent in country *i*;

P_i is the productivity in country *i*;

Y_i is the level of income in country *i*;

C_i is the cost of living in destination *i*;

V_i is the cost of travel to destination *i*;

E_i is the exchange rate in country *i*;

A_i is the total spend in advertising by country *i*;

I_i is the number of the Internet users in country *i*;

M_i is a dummy that considers that the beginning of electronic commerce occurred in 2002.

μ_i is a disturbance term.

B) The exponential functional form, also called Cobb-Douglas function, was considered in this analysis. After the logarithmic transformation of the Cobb-Douglas function, we obtained the following linear function,

$$\ln D_{it} = \alpha_i + \beta_1 \ln P_{it} + \beta_2 \ln Y_{it} + \beta_3 \ln C_{it} + \beta_4 \ln V_{it} + \beta_5 E_{it} + \beta_6 \ln A_{it} + \beta_7 I_{it} + \beta_8 M_{it} + \mu_{it} \quad (5)$$

4.3.3. Data collection and variables construction

A) Because of the lack of data for some indicators, only 18 countries were analyzed, namely Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

B) Taking into account the variables and the countries mentioned above, it was only possible to analyse data from 1993 to 2007, making a total of 15 years.

C) Annual data was used to eliminate the seasonal pattern.

D) Some countries had to be excluded for lack of data on the variables considered, as was the case of Andorra, Gibraltar, Iceland, Liechtenstein, Luxembourg, Malta and Monaco.

E) Microsoft Excel was used to transform the data into tables to be exported into the software package that will be used for the econometric analysis, Eviews 6.0.

4.4 Panel Data Estimation

In the environment that characterizes today's society, tourism demand has been strongly supported by ICT, particularly with regard to the Internet, for sharing information, and for the electronic commerce, to buy/sell tourism products. To analyse the effects caused by ICT on the tourism sector, it should be noted that the variables obtained will have a small limitation in temporal terms, moreover, one should also consider social variables which could justify the volumes of tourism demand for a given destination.

Econometric methods of panel data modeling are ideal to analyze tourism demand in that context, since they allow us to analyze simultaneously temporal and sectional characteristics of the data, in which the temporal dimension is

relatively small, and allow the inclusion of other variables, such as social variables.

In addition to the benefits of using panel data, these also present limitations that must be overcome, as for example: the design of the database, the problem of selecting the variables and the time period considered.

In panel data modeling, it is important to detect whether the model best suited contains fixed or random effects. To detect the effects that should be used, it is necessary to apply the Breush-Godfrey test statistic, proposed by Haussman and presented in equation (6). To perform this test, it is necessary to do a panel data estimation with fixed effects and another with random effects. Thus,

$$H = (\hat{b}_{fe} - \hat{b}_{re})'(\hat{\Sigma}_{fe} - \hat{\Sigma}_{re})(\hat{b}_{fe} - \hat{b}_{re}) \quad (6)$$

For this test, we obtained the value of $\chi^2 = 18{,}76$ and the p-value = 0,0161. For this probability, considering a 5% significance level, the null hypothesis is rejected, and therefore the model to be used is the one with fixed effects, which is usually the most appropriate.

After the first estimation of panel data model (see table 4), the model specification was excellent, however, it was composed of variables whose p-values were exceeding 0,05. Consequently, a new estimation was performed in which these statistically insignificant regressors were removed. In particular, the variables that proved to be statistically insignificant were: population, income, exchange rate, marketing and commerce. The new model estimated continues to display an excellent adjustment to the data (it explains about 99% of tourism demand).

After the second estimation (see table 4), the determinants that most affect tourism demand in the countries concerned are: the cost of living, the cost of travel to the destination and ICT. It can be concluded that the number of

Internet users affects positively the tourism demand in Western Europe, and presents an elasticity of 0,03.

Table 4 – Results of the Panel Data Model Estimation with Fixed Effects

	1st Estimation R^2 = 0,9927 Adjusted R^2 = 0,9919		2nd Estimation R^2 = 0,9922 Adjusted R^2 = 0,99159	
	Coefficient	Probability	Coefficient	Probability
C	15,28109	0,0000	14,96787	0,0000
LN_P	-0,070958	0,1529		
LN_Y	0,015959	0, 5651		
LN_C	0,223597	0,0000	0,158634	0,0000
LN_V	0,134239	0,0000	0,109022	0,0000
LN_E	-0,029878	0,1327		
LN_A	-0,050968	0,1084		
LN_I	0,042897	0,0000	0,029770	0,0000
M	-0,034296	0,1210		

5. Conclusions

The Internet has revolutionized the way of travelling by loosening and customizing touristic products. The internet has enabled the creation of a tailor-made tourist trip. It makes the choice of personalized products possible, in accordance with the taste and wishes of each traveller. According to the results obtained in this article, the Internet and all technological developments have had a significant and positive contribution on tourism demand.

The volume of worldwide tourists has grown markedly. Tourists increasingly resort to the Internet to search and to buy their travel components, to find new destinations and to obtain new experiences. The Internet is the ideal partner for the tourism activity, since it enables information sharing and distribution of tourism products.

The present study allows us to conclude that the greater the number of Internet users, the greater will be the probability of tourism demand to increase. In this context, it should be noted that the online presence of public and private

organizations, connected to tourism, to query or to purchase travel components is of extreme importance.

References:

Baltagi, B. H. (1995) *Econometric Analysis of Panel Data*, 1nd Edition, Wiley & Sons, West Sussex.

Baltagi, B. H. (2001) *Econometric Analysis of Panel Data*, 2nd Edition, Wiley & Sons, West Sussex.

Buhalis, D. (1994) Information and telecommunications technologies as a strategic tool for small and medium tourism enterprises in the contemporary business environment, in Seaton, A.V.(ed.) Tourism: The State of the Art, England, John Wiley & Sons, 254-274.

Buhalis, D. (2003) *eTourism: Information Technology for strategic management*, London, Prentice Hall.

Buhalis, D. and C. Costa (2006) Tourism Management dynamics – trends, management and tools; Oxford, Elsevier.

Carey, K. (1991) Estimation of Caribean Tourism Demand: Issues in Measurement and Methodology, *Atlantic Economic Journal*, 19, 32-40.

Correia, A. (2000) *A Procura Turística no Algarve*, Universidade do Algarve, Tese de Doutoramento.

Crouch, G. (1994b) The Study of International Tourism Demand: A Review of Findings, *Journal of Travel research*, 33 (1), pp. 12-23.

Cunha, L. (2003) *Introdução ao Turismo*, Editorial Verbo, 2 ed., Lisboa.

Daniel, A.C.M. and P.M.M. Rodrigues (2009) O Turismo em Portugal: Evolução Histórica, Caracterização e Perspectivas, In Avanços em Economia e Gestão do Turismo: Novas Tendências, Sustentabilidade e Desenvolvimento Regional, Ed. Álvaro Matias e Raul Sardinha, Instituto Piaget, pp.61-78.

O'Connor, P. (1999) *Electronic Information Distribution in Tourism and Hospitality*, CAB, Oxford.

Poon, A. (1993) *Tourism, Technology and Competitive Strategies*, Wallingford, C A B International.

Ramos, C.M.Q., P.M.M. Rodrigues and F. Perna (2009), Sistemas e Tecnologias de Informação no Sector Turístico, in *Revista Turismo & Desenvolvimento*, Aveiro, nº 12, pp. 21-32.

Romano, A. (2005) *Dynamic Packaging as a Strategic Solution for the future of European Mass-market Tour Operators*, Tese de Mestrado [online], Disponível em URL: http://www.du.se/upload/9277/Romano%20Anna%20.pdf, [data de último acesso: 08-05-2007].

Sheldon, P. J. (1997) *Tourism Information Technology*, Wallingford, C A B International.

Song, H. and S. Witt (2000) *Tourism demand modelling and forecasting: Modern econometric approaches*, Pergamon, New York.

Song, H., S. Witt and G. Li (2009) *The Advanced Econometrics of Tourism Demand*, Taylor and Francis, Routledge.

Tremblay, P. (1989) Polling International Tourism in Western Europe, *Annals of Tourism Research*, 16, 677-91.

Uysal, M. (1998) The Determinants of Tourism Demand: A theoretical perspective In D. Ioannides and Debbage, K. G: (Eds.) *The economic geography of the tourist industry: A supply-side analysis*, Routledge, New York, pp. 79-95.

Werthner, H. and S. Klein (1999) *Information Technology and Tourism – A Challenging Relationship*, Viena, Springer-Verlang.

Witt and Witt (1995) Forecasting Tourism Demand: A review of Empirical Research, *International Journal of Forecasting,* 11:447-475.

Witt, S.F. (1980a) An Abstract Mode-Abstract (Destination) Node Model of Foreign Holiday Demand, *Applied Economics*, 12, 163-80.

Witt, S.F. (1980b) An Econometric Comparison of UK and German Foreign Holiday Behaviour, *Managerial and Decision Economics*, 1, 123-31.